

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

SAN DISK CORPORATION,

No. C 11-5243 RS

Plaintiff,

v.

CLAIMS CONSTRUCTION ORDER

ROUND ROCK RESEARCH LLC

Defendant.

I. INTRODUCTION

Plaintiff SanDisk Corporation brought this action seeking declaratory relief that its products do not infringe certain patents held by defendant Round Rock Research LLC, and/or that the patents are invalid. Pursuant to the Local Patent Rules, the parties have presented the claim terms they contend should be construed by the Court. The parties presented a technology tutorial, and a claims construction hearing has been held. This order sets out the constructions that will be adopted and the reasons therefor. In one instance, the parties will be requested to provide further briefing.

II. BACKGROUND

Round Rock describes itself as a technology research and licensing company that holds thousands of patents and pending patent applications. Round Rock is what is commonly described

as a “non-practicing entity”—that is, it does not manufacture or market products utilizing its patented inventions, but instead seeks licensing agreements from parties who do make and sell such products, or pursues litigation against them when it deems it necessary to do so. Round Rock acquired its patent portfolio from Micron Technology. The claimed inventions relate to a variety of products and technologies, such as televisions, cell phones, computers, cameras, processors, and memory products, among other things. SanDisk, in turn, designs, manufactures, and sells a wide variety of flash memory devices.

Seven patents held by Round Rock are in issue. U.S. Patents Nos. 5,286,344 and 5,783,282 relate generally to the fabrication of semiconductor devices. U.S. Patent No. 6,383,839 relates to mounting semiconductor devices on circuit boards. U.S. Patent Nos. 5,682,345 and 6,272,586 and 6,570,791 and 6,845,053 all relate to configuration and circuit design of semiconductor devices.

III. LEGAL STANDARD

Claim construction is a question of law to be determined by the Court. *Markman*, 52 F.3d at 979. “Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (quoting *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998)). Accordingly, a claim should be construed in a manner that “most naturally aligns with the patent’s description of the invention.” *Id.*

The first step in claim construction is to look to the language of the claims themselves. “It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). A disputed claim term should be construed in a manner consistent with its “ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Phillips*, 415 F.3d at 1312-13. The ordinary and customary meaning of a claim term may be determined solely by

1 viewing the term within the context of the claim’s overall language. *See id.* at 1314 (“[T]he use of a
2 term within the claim provides a firm basis for construing the term.”). Additionally, the use of the
3 term in other claims may provide guidance regarding its proper construction. *Id.* (“Other claims of
4 the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment
5 as to the meaning of a claim term.”).

6 A claim should also be construed in a manner that is consistent with the patent’s
7 specification. *See Markman*, 52 F.3d at 979 (“Claims must be read in view of the specification, of
8 which they are a part.”). Typically the specification is the best guide for construing the claims. *See*
9 *Phillips*, 415 F.3d at 1315 (“The specification is . . . the primary basis for construing the claims.”);
10 *see also Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) (“[T]he
11 specification is always highly relevant to the claim construction analysis. Usually, it is dispositive;
12 it is the single best guide to the meaning of a disputed term.”). In limited circumstances, the
13 specification may be used to narrow the meaning of a claim term that otherwise would appear to be
14 susceptible to a broader reading. *See SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*,
15 242 F.3d 1337, 1341 (Fed. Cir. 2001); *Phillips*, 415 F.3d at 1316. Precedent forbids, however, a
16 construction of claim terms that imposes limitations not found in the claims or supported by an
17 unambiguous restriction in the specification or prosecution history. *Laitram Corp. v. NEC Corp.*,
18 163 F.3d 1342, 1347 (Fed. Cir. 1998) (“[A] court may not import limitations from the written
19 description into the claims.”); *Comark Commc’ns., Inc. v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed.
20 Cir. 1998) (“[W]hile . . . claims are to be interpreted in light of the specification, it does not follow
21 that limitations from the specification may be read into the claims.”); *SRI Int’l v. Matsushita Elec.*
22 *Corp. of Am.*, 775 F.2d 1107, 1121 (Fed. Cir. 1985) (en banc) (“It is the *claims* that measure the
23 invention.”) (emphasis in original). A final source of intrinsic evidence is the prosecution record
24 and any statements made by the patentee to the United States Patent and Trademark Office (PTO)
25 regarding the scope of the invention. *See Markman*, 52 F.3d at 980.

26 The court also may consider extrinsic evidence, such as dictionaries or technical treatises,
27 especially if such sources are “helpful in determining ‘the true meaning of language used in the
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1 patent claims.”” *Phillips*, 415 F.3d at 1318 (quoting *Markman*, 52 F.3d at 980). Ultimately, while
 2 extrinsic evidence may aid the claim construction analysis, it cannot be used to contradict the plain
 3 and ordinary meaning of a claim term as defined within the intrinsic record. *Phillips*, 415 F.3d at
 4 1322-23.

5 Once the proper meaning of a term used in a claim has been determined, that term must have
 6 the same meaning for all claims in which it appears. *Inverness Med. Switzerland GmbH v.*
 7 *Princeton Biomeditech Corp.*, 309 F.3d 1365, 1371 (Fed. Cir. 2002).

8 9 IV. DISCUSSION

10 11 **A. '344 patent**

12 The '344 patent involves a process for etching patterns in a layer of silicon dioxide (SiO₂)
 13 during the fabrication of semiconductor devices. The parties dispute three terms, the first two of
 14 which may be treated together.

15 16 1. “high SiO₂ etch rate/ “high level of selectivity”

17 As explained in the tutorial presented by the parties, an “etch rate” is the speed at which
 18 material is removed from a silicon wafer during semiconductor fabrication. It is typically expressed
 19 in angstroms per minute. The term “selectivity” in this context undisputedly refers to a *difference*
 20 in etch rates between layers of two different materials—such a difference is useful so that the top
 21 layer can be etched away without causing excessive etching of the underlying layer before the
 22 process is halted. Selectivity is expressed as a ratio of the respective etch rates of the two layers.

23 SanDisk contends the modifier “high” as applied both to “etch rate” and “level of
 24 selectivity” leaves claim 1 of the '344 patent fatally indefinite. Round Rock contends that “high
 25 SiO₂ etch rate” can be construed as “at least about 2500 angstroms of SiO₂ per minute,” because the
 26 specification states the process produces a “preferred high SiO₂ etch rate which is at least about
 27 2500 angstroms per minute, more preferably at least about 3000 angstroms per minute, and most
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1 preferably at least about 4000 angstroms per minute. . . .” ’344 patent, 5:18-23. Round Rock
2 similarly relies on the specification to supply the “about 10:1” ratio for the meaning of “high level
3 of selectivity,” although the specification again states a series of increasingly preferred higher ratios.

4 Relying heavily on *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244 (Fed Cir.
5 2008), SanDisk insists that Round Rock’s selection of one “about” number from a specification that
6 lists several different levels of “preferred” rates cannot save a fundamentally indefinite claim that
7 fails to “delineate the outer boundaries.” In *Halliburton*, though, the issue was whether “fragile gel”
8 could be defined as one containing “no or low organophilic clay or lignite,” where the specification
9 indicated it was preferable for no such clays to be present. *See* 514 F.3d at 1250-51. While SanDisk
10 insists that the *Halliburton* patentee was thereby similarly attempting to import a “number” from the
11 specification (i.e., “no” clay means “zero” clay), the circumstances are not alike. The indefinite term
12 in *Halliburton* was “fragile,” which the patentee argued could be understood by looking to several
13 different features described in the specification, not just the absence of clay. *Id.* Moreover, fragility
14 is not measured in units of clay, so using an absence or near absence of clay to define “fragile” was
15 attenuated. In contrast, defining a “high” etch rate and level of selectivity by looking to numbers
16 provided in the specification is straightforward.

17 In *Exxon Research and Engineering Co. v. United States*, 265 F.3d 1371 (Fed Cir. 2001) a
18 term “to increase substantially” was found not to be indefinite in light of a disclosure in the
19 specification calling for an “increase of at least about 30%, more preferably an increase of about
20 50%, and still more preferably an increase of about 75%.” *Id.* at 1377. The only difference between
21 *Exxon* and the present case is that the specification here uses “preferably” prior to the lowest
22 numbers in the ranges. SanDisk’s argument to the contrary notwithstanding, that distinction does
23 not support reaching a different conclusion.

24 “[C]laims are not indefinite merely because they present a difficult task of claim
25 construction.” *Halliburton*, 514 F.3d at 1249. “Instead, ‘[i]f the meaning of the claim is discernible,
26 even though the task may be formidable and the conclusion may be one over which reasonable
27 persons will disagree, we have held the claim sufficiently clear to avoid invalidity on indefiniteness
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grounds.” *Id.*(quoting *Exxon*). Because the meaning of “high” can be determined with reference to the specification, Round Rock’s constructions will be adopted and SanDisk’s contention that the claim is indefinite will be rejected.¹

2. “Perpendicular to”

Claim 1 of the ’344 patent includes the phrase: “the contact sidewalls of said SiO₂ outer layer are perpendicular to the multilayer structure layers.” The parties dispute the construction of “perpendicular to.” Round Rock proposes replacing “perpendicular to” with “substantially vertical in relation to.” SanDisk argues that “perpendicular to” should be replaced with “at an angle of ninety degrees and not sloped with respect to.”

The prosecution history reveals that the term originally used was phrase “substantially upright,” which the examiner objected was “vague, indefinite, and confusing.” Round Rock speculates that the examiner’s concern arose from the fact that the specification already defined “upright” as “substantially vertical.” Hence, “substantially upright” would translate to “substantially substantially vertical,” which would indeed be confusing.

Whether or not that was the particular concern of the examiner, the fact remains that the patentee abandoned the term, “substantially upright” in favor of “perpendicular.” Round Rock insists this does not rise to the level of a “clear and unmistakable” prosecution disclaimer. *See Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1325-26 (Fed.Cir. 2003) (“[F]or prosecution disclaimer to attach, our precedent requires that the alleged disavowing actions or statements made during prosecution be both clear and unmistakable.”) Round Rock may very well be correct that this is not an instance of prosecution disclaimer *per se*, particularly because that doctrine applies to “narrow the ordinary meaning of the claim” to be congruent with some unequivocal disavowal made during the prosecution. *Id.* at 1324. Here, as will be discussed further, although “perpendicular”

¹ Dependent claims 4 and 5 define the selectivity and etch rates, respectively, in exactly the manner claim 1 has now been construed, and are therefore redundant. Claim differentiation, however, “does not trump the clear import of the specification.” *Eon-Net LP v. Flagstar Bancorp*, 653 F.3d 1314, 1323 (Fed. Cir. 2011).

1 may have a theoretical, mathematical, meaning of lines at an exact 90 degree angle to each other, its
2 use in a claim term cannot ordinarily require an infinite degree of precision in real world
3 manufactured materials. Round Rock's substitution of "perpendicular" for "substantially upright"
4 therefore does not reflect an intent to narrow the ordinary meaning of "perpendicular."

5 Even if this therefore is not strictly a case of prosecution disclaimer, however, the fact that
6 "substantially" was deliberately omitted from the claim in response to the examiner's concerns
7 weighs heavily against re-inserting it into a construction of the term now. While "perpendicular"
8 may not require perfect precision, Round Rock has shown no basis for adopting a construction that
9 would allow even greater variance from theoretical perfection than exists within the ordinary usage
10 of the term.

11 Conversely, SanDisk has not established any grounds for departing from the plain and easily
12 understood word "perpendicular," and instead using the cumbersome phrase "at an angle of ninety
13 degrees and not sloped with respect to." It appears that the parties may be attempting to address
14 through claim construction an issue that more properly is part of an infringement analysis.
15 Specifically, the parties seem to be striving to resolve at this juncture how close to the theoretically
16 perfect perpendicular something must be to fall within the ordinary meaning of "perpendicular."
17 Such a question cannot be answered in the abstract, however. Whether a something can reasonably
18 be considered "perpendicular" depends on any number of factors, including the type of materials
19 involved, the purposes being served, the scale of the objects involved, and how measurements are
20 taken. For example, in an ordinary, well constructed room, observers likely would agree that the
21 walls are "perpendicular" to the floor. Yet it might be that precise measurements could detect some
22 small deviations from precise 90 degree angles. Indeed, other than in a theoretical mathematical
23 construct where planes have only two dimensions and lines have only one, determining that one
24 surface is not *perfectly* perpendicular to another only requires measuring with sufficiently precise
25 instruments to observe the real world imperfections.

26 SanDisk's proposed substitution of at "an angle of ninety degrees" would do nothing to
27 eliminate this issue. Whether something is close enough to a ninety degree angle to be qualify as a
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ninety degree angle is no different from determining the degree of precision to be applied when evaluating whether something is perpendicular. Accordingly, the term “perpendicular to” in claim one will be given no construction beyond its ordinary meaning. The parties will be free to argue to the trier of fact that a particular sidewall is or is not “perpendicular,” given whatever deviation from theoretical perfection can be measured. With the benefit of a full record on the various factors that may be relevant to determining the tolerances to be applied, the trier of fact will be able to evaluate whether a particular sidewall in the real world should or should not be considered “perpendicular.”

B. '282 patent

1. “depositing a first material onto a semiconductor substrate”

Claim 2 of the '282 patent begins with a preamble: “A method of depositing a first material onto a semiconductor substrate the method comprising the steps of” followed by a list of steps that make up the claim itself. SanDisk proposes a construction that would add language about “direct contact” and would define “semiconductor substrate” in a particular manner. Round Rock contends that element of the preamble is not a claim limitation and thus requires no construction.

SanDisk has not shown how anything in this preamble serves as a limitation of the claims such that a construction of the preamble language itself would be necessary or appropriate. *See American Medical Systems, Inc. v. Biolitec, Inc.*, 618 F.3d 1354, 1359 (Fed.Cir. 2010)(“the preamble has no separate limiting effect if, for example, the preamble merely gives a descriptive name to the set of limitations in the body of the claim that completely set forth the invention.” (citation omitted).) While “semiconductor substrate” may warrant construction where it appears in the body of the claim, and that construction will apply equally here, no separate construction of the preamble is warranted.

2. “sputtering the first material onto the semiconductor substrate”

1 The body of claim 2 of the '282 patent includes the step: "sputtering the first material onto
2 the semiconductor substrate."² Round Rock proposes no construction for this phrase other than to
3 substitute "to" for "onto" and to add "to form a thin film" at the end. Round Rock has not shown
4 how changing "onto" adds clarity or is supported by claim construction principles. The claim
5 language immediately following this phrase already states, "to form a layer of sputterdeposited
6 material." Round Rock has offered no basis for adding "to form a thin film" prior to that language,
7 and at oral argument acknowledged it could be omitted.³

8 SanDisk proposes construing this phrase as: "depositing, by a sputtering process, a first
9 material in direct contact with a material having an electrical resistivity between the values for
10 metals and insulators." Changing "sputtering" to "depositing, by a sputtering process" is not
11 helpful, as the jury will still need to be educated as to what a "sputtering process" is. Presuming that
12 the parties have no disagreement as to what sputtering is, and that they will explain it to the jury,
13 adding the language "depositing, by a . . . process" will be unnecessary.

14 SanDisk's proposal to define "semiconductor substrate" as "a material having an electrical
15 resistivity between the values for metals and insulators" presents two issues. First, while the
16 reference to the range of electrical resistivity likely is a technically correct description of a
17 "semiconductor," it substitutes complex and unfamiliar language for a much more commonly heard
18 term, without a clear reason for doing so. In other words, while the average juror may not know
19 exactly what a "semiconductor" is, there is no indication that the jury is going to be asked to decide
20 whether something is or is not a semiconductor, such that an understanding of the electrical
21 properties of a semiconductor will be necessary.

24 ² Although the term "sputtering" likely will be unfamiliar to jurors, neither side has proposed
25 construing it, presumably because there is no controversy as to what the sputtering process is. The
26 parties therefore will explain sputtering at trial without a formal construction of the term.

27 ³ If Round Rock instead contemplated substituting "to form a thin film" for "to form a layer of
28 sputterdeposited material," it also did not show such a construction to be warranted.

1 Second, even if it were appropriate to provide a technical definition of “semiconductor,” the
2 actual dispute here is not over what a semiconductor is, but what a semiconductor *substrate* may
3 include. SanDisk’s position is that the semiconductor substrate is *only* the “bottom” layer of a chip,
4 consisting of semiconducting material. Round Rock contends that a semiconductor substrate may
5 include both the semiconductor layer and an insulating layer. While SanDisk’s proposed definition
6 may be intended to accomplish its goal of having “semiconductor substrate” refer only to the
7 semiconductor layer, merely substituting a technical definition of “semiconductor,” while
8 effectively ignoring the term “substrate,” is an inelegant and unclear solution. Accordingly, the
9 proposal to include the phrase “a material having an electrical resistivity between the values for
10 metals and insulators” is rejected.

11 The real dispute between the parties is whether sputtering “onto the semiconductor
12 substrate” should be construed so narrowly as to encompass *only* sputtering where the molecules of
13 one material are deposited directly onto a surface that is a semiconductor, or whether the molecules
14 may also coat layers of insulators that lie above any semiconductor surface. To capture the
15 narrower meaning, SanDisk proposes adding the phrase “in direct contact with”—i.e. material must
16 be sputtered directly onto a semiconductor surface, not an insulating surface. The same result could
17 be achieved with a construction that clearly limited “semiconductor substrate” to the semiconductor
18 base layer, excluding any insulating layer.

19 Notwithstanding the problems with SanDisk’s attempt to define “semiconductor substrate”
20 by merely providing a technical definition of “semiconductor,” it has the better of the substantive
21 argument. The specification plainly and repeatedly identifies the semiconductor substrate as
22 consisting solely of layer of semiconductor material, not any layers of insulating material thereon.
23 See, e.g. Figs. 2a and 2b, semiconductor substrate 224; Figs. 7a and 7b, semiconductor substrate
24 724. In contrast, the specification uses the term “semiconductor *structure*” to refer to the combined
25 layers of semiconductor material, insulating materials, and conductors. For example, Figure 2 is
26 described as a cross-sectional representation of a “semiconductor *structure* comprising a contact
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1 hole 210 etched into an [sic] second material layer 222 [an insulator] and *overlying a semiconductor*
2 *substrate 224.*”⁴

3 Round Rock is correct that it is somewhat odd to speak of a “recess” or a “hole” that is on,
4 rather than in, the semiconductor substrate, given the ordinary meaning of “recess” and “hole.” The
5 specification, though, does exactly that. *See, e.g.*, Col. 2:32-33 (“an insulating material 122, which
6 defines a contact hole 110 *on* a semiconductor substrate 124 (emphasis added). The claim language
7 is completely consistent with the notion that the recess is *in* the insulating layer, with only bottom of
8 the recess formed by the semiconductor substrate, such that the recess is “on,” not “in” the
9 semiconductor substrate. The claim refers to “a recess, having a bottom, and *defined by sidewalls*
10 *comprising a second material [i.e., the insulating layer].*”

11 It is plain from the specification that, at least in the preferred embodiments, the sputtering
12 process results in the first material being coated onto not only the bottom of the recess (the
13 semiconductor substrate, but also the sides of the recess (in the insulating layer) and on top of the
14 insulating layer around the edges of the recess. The claim language contains no limitation
15 precluding the sputtered material from being so deposited on additional surfaces. Indeed as part of
16 the resputtering in subsequent steps, it likely is necessary for material to have been deposited on the
17 top corners of the recess. The step of “sputtering the first material onto the semiconductor
18 substrate,” however, does at a minimum require that the sputtered material coat a semiconductor
19 surface, not merely an insulating or other surface that overlies a semiconductor surface. Conveying
20 that limitation by adding the phrase “in direct contact with” is cumbersome, when the specification
21 more plainly supports the simpler notion that “semiconductor substrate” should be seen as *only* the
22 layer of semiconductor material, and not other layers of the “semiconductor structure.” Accordingly
23 the jury will be instructed that “semiconductor substrate” means a layer or surface made of
24 semiconductor material. With that definition, and with an explanation of “sputtering,” the

25 ⁴ Elsewhere the specification is not entirely precise in distinguishing between “substrate” and
26 “structure.” *See* 5:60-62; 11:19-26 (describing 440 as both a “semiconductor structure, such as
27 wafer 440” and “substrate 440.” This imprecision is not enough to support a conclusion that term
28 semiconductor substrate should be understood to include insulating and other layers of material.

1 remainder of the phrase “sputtering the first material onto the semiconductor substrate” should be
2 sufficiently understandable for the jury without further construction.

3
4 3. “bias voltage”

5 The second step of claim two describes a “resputtering” process and calls for “applying a
6 first bias voltage to the substrate.” The parties dispute how the term “bias voltage” should be
7 construed. Round Rock’s proposes that it be defined as, “a voltage applied to a semiconductor
8 substrate during a sputtering process.” While that language is consistent with the claim, it merely
9 repeats words already present in the the claim and would not advance the trier of fact’s ability to
10 understand the scope of the claim.

11 SanDisk seeks to have the term construed to include a limitation that the voltage be a
12 *negative* voltage. Although its proposal would also eliminate the word “bias,” SanDisk does not
13 argue that “bias” means “negative.” Indeed, there appears to be no dispute that, in the abstract, a
14 “bias voltage” could be either positive or negative. SanDisk argues, however, that in this context,
15 the voltage *must* be negative for the sputtering process to work, as a matter of “fundamental
16 physics.”

17 Round Rock responds that SanDisk is “simply wrong” about the physics, and that it has been
18 “well known for decades that sputtering may be performed with either positive or negative voltages
19 applied to the substrate.” Round Rock points to U.S. Patent No. 4,747,922, filed in 1986, as an
20 example that teaches either a positive or negative voltage may be used. The defect in Round Rock’s
21 argument, however, is that the second step of claim two involves so-called *re*-sputtering, where the
22 molecules being dislodged from one place and deposited on another surface come not from a
23 separate “target,” but from the excess material deposited on the shoulders of the recess during the
24 initial sputtering step. See ’282 patent 11:19-24 (“[A] negative bias voltage is applied at the
25 substrate surface 440, as shown in Fig. 4 causing it to act like another target.”)

26 The ’922 patent relied on by Round Rock is entirely consistent with the notion that the bias
27 voltage applied to the substrate must be negative to cause material to be dislodged *from* the
28

1 substrate. Its specification makes clear that when a *positive* voltage is applied to the substrate, the
 2 molecules being dislodged through sputtering will come from the target, not the substrate. '922
 3 patent, 4:67-5:7. Conversely, the '922 patent specification discloses that when the substrate is
 4 negatively charged, molecules will dislodged from the substrate in what is referred to as an "ion
 5 beam polishing" process, '922 patent 5:47-67, or simply for "cleaning" the substrate "preparatory to
 6 sputter deposition thereon." '922 patent 3:55-67. Furthermore, at oral argument, Round Rock
 7 conceded that the charge applied to the "target" would have to be negative for sputtering to occur.
 8 Round Rock only has not acknowledged that the material on the shoulders of the recess effectively
 9 is the "target," during "resputtering."

10 Accordingly, SanDisk has shown that the bias voltage indeed must be negative for the
 11 process described in the second step of claim 2. It remains somewhat unclear, however, why it
 12 SanDisk believes necessary to "construe" the term to include the word "negative," given that any
 13 prior art method or accused method not employing a negative voltage would, as a "matter of
 14 fundamental physics" be doing something other than the "resputtering" process described in the
 15 claim. Nevertheless, because the specification plainly teaches that the "bias voltage" applied to the
 16 substrate in the second step is negative, SanDisk's construction will be adopted.

17 18 **C. '839 patent**

19 The '839 patent relates generally to claimed advances in methods for mounting chips
 20 "vertically" on circuit boards—that is with only one edge of the chip in contact with the board,
 21 rather than the chip lying on and parallel to the surfaced of the board. The claims include methods
 22 for adapting preexisting chip circuitry designs to allow chips to be edge mounted.

23 1. "reconfiguring a connection pattern of a preexisting semiconductor device design"

24 At oral argument, the parties reported reaching agreement that the phrase the phrase
 25 "reconfiguring a connection pattern" is part of a preamble and does not serve as a claim limitation
 26 for either purposes of infringement or invalidity. Accordingly, the parties agree that no
 27 construction is necessary.
 28

1 2. “preexisting design”

2 Similarly, the parties have reported resolving their prior disputes regarding the term
3 “preexisting design.” Specifically, they have stipulated to adopt SanDisk’s proposal that the term be
4 construed as “a previous design (as opposed to a new design).” While it is not apparent that this
5 construction leads to significantly greater clarity, in light of the parties stipulation and because it is
6 consistent with the meaning discernible from the specification, it will be adopted.

7
8 3. “semiconductor device”

9 Claims 1, 3, 5, and 8 of the ’839 patent all contain the term “semiconductor device,” which
10 Round Rock proposes construing as “an electronic device fabricated from semiconductor materials.”
11 SanDisk argues the term should be construed simply as, “a semiconductor die.” As discussed at the
12 hearing, it seems likely that the average juror would not immediately understand the intended
13 meaning of the word “die,” rendering SanDisk’s proposal problematic. SanDisk therefore suggested
14 that “chip” would be acceptable because, it asserts, both “die” and “chip” are used to refer to one
15 integrated circuit cut from a larger “wafer” during the manufacturing process.

16 Jurors may very well be familiar with the term “semiconductor chip,” particularly in this
17 venue, and may have some sense of what it means. At least in some contexts, however, the term
18 “chip” is used to refer to *packaged* integrated circuits. The point of SanDisk’s argument is that, in
19 its view, this term should be construed as limited to “bare” chips.

20 SanDisk is correct that the invention, as described in the specification, involves chips that
21 are installed directly on a circuit board, with no or only minimal “packaging,” and that some of the
22 claim language and descriptions would make little sense if applied to a packaged chip. As described
23 in the “Field of the Invention,” “the present invention relates to vertically mountable, *bare or*
24 *minimally packaged* semiconductor devices.” (Emphasis added.) The specification, however, also
25 at least leaves open the possibility that at least some of the methods claimed could have application
26 where the chip is packaged to one degree or another. See ’839 patent ____ (“*Preferably*, the
27 semiconductor device is bare or minimally packaged.” (emphasis added)).

Accordingly, SanDisk has not shown it to be either necessary or appropriate to construe the common term “semiconductor device” as having any special or narrow meaning. To the extent the claims describe methods that simply are inapplicable to packaged chips, the term need not be expressly limited. If, however, any of the methods do have application to packaged chips, the record does not support narrowing the claims to exclude that possibility.

4. “toward a single edge” / “adjacent a single edge thereof”

These terms relate to reconfiguring preexisting circuit designs to allow chips to be installed on-edge. The leads or traces that join the circuitry on the chip to the circuitry on the board must be rerouted to run to the particular edge that will be in contact with the circuit board, and “bond pads” must be provided along that edge. The parties have no substantive disagreement as to the meaning of these terms; their differences lie in how best to express the concept in a way that will not confuse the jury. SanDisk insists the term “only one” should be substituted for “a single.” SanDisk worries that because the claim is written in a “comprising” format, it could be satisfied by a chip that has leads and bond pads along more than one edge, unless the construction includes the word “only.”

Round Rock, however, expressly disavows any intent to argue that a chip with leads and bond pads situated along multiple edges is within the scope of the claim. Round Rock worries however, that “only” is too restrictive because a lead or bond pad near a *corner* could be understood to be adjacent to two edges.⁵ While Round Rock’s construction likely would avoid that theoretical problem, it does not address the issue raised by SanDisk that, absent the word “only,” a chip with bond pads and leads along one edge would satisfy the claim even if it *also* had leads and bonds along another edge. As Round Rock agrees that such a chip would be outside the scope of this claim, SanDisk’s proposed construction is more appropriate, and will be adopted. Round Rock will

⁵ Round Rock also argues the jury could be confused if a lead runs towards one edge at any point before turning towards the edge where it ultimately terminates. That concern is more theoretical than real. If Round Rock is genuinely concerned that the jury may think a lead must go towards the edge in a straight line without turning any corners, it may explain to the jury that is not so, even under the “only” language of the construction.

1 be free to explain to the jury, if it believes it necessary to do so, that a bond pad in a corner does not
2 fall outside this claim.

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4
5 **D. '345 patent**

6 The '345 patent claims a device—a non-volatile data storage unit—and a method for
7 controlling its operation. The parties seek construction of three means-plus-function terms
8 appearing in claim 1. In all three instances, the parties agree as to the function identified in the
9 claim, but disagree as to what structure described in the specification, if any, performs that function.

10
11 1. “control means”

12 Claim 1 refers to a “control means for controlling operation of the data storage unit” and
13 states that it includes the “load means,” the “programming means,” and the “recall means,” each of
14 which have further functions described. While the parties agree that the function of the control
15 means is, as stated, “controlling operation of the data storage unit,” SanDisk contends no structure is
16 disclosed that actually *controls* that operation. Round Rock argues the structures underlying the
17 load means, programming means, and recall means make up the structure of the control means.

18 In many ways, the clause of the claim referring to “control means” resembles a claim
19 preamble, more than a typical means-plus-function term. *Compare American Medical, supra*, 618
20 F.3d at 1359 (“the preamble has no separate limiting effect if, for example, the preamble merely
21 gives a descriptive name to the set of limitations in the body of the claim that completely set forth
22 the invention.”) The “control means” is merely a descriptive name for the set of the three means
23 that follow it.

24 While unusual, neither party has suggested that it is impermissible for a means-plus-function
25 term to group together other means-plus-function terms, such that the structure for the grouping
26
27
28

term is nothing more than the structure of the individual terms. Accordingly, RoundRock's construction will be adopted.⁶

2. "program means"

The term "program means" appears in typical means-plus-function format. The first step in construing a means-plus-function limitation is to identify the function explicitly recited in the claim. *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1376 (Fed. Cir.2001). The next step is to identify the corresponding structure set forth in the written description that performs the particular function set forth in the claim. 35 U.S.C. § 112 (f) does not "permit incorporation of structure from the written description beyond that necessary to perform the claimed function." *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1257-58 (Fed.Cir. 1999). Structural features that do not actually perform the recited function do not constitute corresponding structure and thus do not serve as claim limitations. *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 145 F.3d 1303, 1308-09 (Fed.Cir. 1998); *see B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed.Cir. 1997) ("[S]tructure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.").

Here, the parties agree that the function of the program means is "programming the non-volatile memory device with data from the volatile memory device." Round Rock contends the structure described in the specification that is linked to this function is the combination of transistors 24 and 26. SanDisk argues that it is instead transistors 16 and 20, part of the "latch circuit," that do the programming.

The programming function is described at column 4, line 33 through column 5, line 18 of the patent. Both sets of transistors are described as having a role in the process. Round Rock

⁶ SanDisk's arguments that the structures of the subsidiary means do not effectively "control" the data storage unit depends on the meaning of "controlling," a term that has not been presented for construction. Claim construction, of course, also does not reach any enablement issues that may exist.

1 characterizes transistors 16 and 20 as merely “storing” the data that is later programmed into the
2 non-volatile memory. In its view, the programming only happens when transistors 24 and 26
3 function to transmit the data into the non-volatile memory cells. SanDisk, in turn, points to the fact
4 that the “programming current” is provided by transistors 16 and 20, and it characterizes transistors
5 24 and 26 as merely providing a pathway for the data to flow through.

6 The characterizations offered by both sides have some persuasiveness. In one sense Round
7 Rock is correct that programming does not take place until transistors 24 and 26 come into
8 operation; unless that happens, transistors 16 and 20 will merely store the data indefinitely. Yet it is
9 transistors 16 and 20 that provide the programming current. Also, the specification specifically
10 states that the flash cells are “programmed by *first* loading the programming data in the Latch
11 section 12.” ’345 patent 3:52-54 (emphasis added). Thus, while both sides have made strong
12 showings that the transistors they identify should be considered part of the structure “clearly linked”
13 to performing the “programming” function, neither side has established that the other pair of
14 transistors should *not* be included.

15 Before adoption of a construction at such substantial variance to what either side has offered,
16 however, the parties will be given the opportunity to brief the issue of whether the structure should
17 be identified as all four of the transistors, and possibly even additional linking circuitry. The parties
18 may submit supplemental briefs, not to exceed 15 pages each, addressing this question. The briefs
19 shall be filed simultaneously on such date as the parties may agree, but no later than May 31, 2013.

20
21 3. “recall means”

22 The parties agree that the function of the recall means is “transferring data from the non-
23 volatile memory device to the volatile memory device.” They also agree that transistors 24 and 26
24 are the associated structure. They propose slightly different language to capture this concept, with
25 Round Rock advocating for “a pair of transistors coupled between a latch circuit and a non-volatile
26 memory device and equivalents thereof,” and SanDisk preferring “a pair of transistors connected
27 between the non-volatile memory and the corresponding halves of the volatile memory latch 12, and
28

1 equivalents thereof.” SanDisk has clarified that its reference to the “corresponding halves” of the
2 memory latch is not intended to suggest that the latch circuitry is part of the structure. With that
3 clarification, it is appropriate to adopt SanDisk’s construction.

4
5 **E. '586 patent**

6 The '586 patent relates to flash memory systems designed to have certain parameters that
7 can be adjusted after fabrication for optimum performance. One claim term is in dispute.

8
9 1. “a length of a communication data stream”

10 Round Rock proposes this term be construed as a “number of bits sent in a single read or
11 write operation,” whereas SanDisk would have it as, “the number of bits that are simultaneously
12 transmitted or received.” SanDisk contends the patent is directed to providing memory systems
13 capable of being adapted to differing “word” lengths (*e.g.* eight bit or sixteen bit systems), and that
14 its proposed construction correctly captures this. Round Rock insists SanDisk is improperly
15 attempting to limit the claims based on preferred embodiments, and that “length” need not be seen
16 exclusively as word length. Round Rock contends instead length merely means “number of bits”
17 (as both sides’ proposals state) and that as such, there is no reason to include “simultaneous”
18 transmission or reception as a limitation.

19 “[T]he distinction between using the specification to interpret the meaning of a claim and
20 importing limitations from the specification into the claim can be a difficult one to apply in
21 practice.” *Phillips*, 415 F.3d at 1323. Here, SanDisk is correct that the specification describes
22 adapting the memory systems to differing word lengths. It has not shown, however, a basis for
23 limiting the claim itself to include the word “simultaneously.” Accordingly, Round Rock’s
24 construction will be adopted.

25
26 **F. '791 patent**

1 The '791 patent relates to flash memory designed to be compatible with DDR DRAM. The
2 parties seek construction of two terms.

3
4 1. "flash memory"

5 The parties agree that the term "flash memory" appearing in claim 14 ordinarily has a
6 meaning that is well understood and would likely not need construction, even for the benefit of a
7 jury. There are, however, various types of flash memory, and SanDisk contends that the patent
8 applicant effectively disclaimed the use of flash memories that employ a current-sensing technique.
9 Thus, SanDisk argues, the scope of claim 14 should be limited to flash memories that employ a
10 voltage-sensing technique.

11 SanDisk has again shown a focus in the specification that is narrower than the language used
12 in the claim. Particularly to the extent that the specification exclusively teaches using voltage-
13 sensing techniques to achieve the purposes of the claimed invention, there could be enablement or
14 other issues in extending the claims to flash memories employing current-sensing. As a matter of
15 claim construction, however, SanDisk has not shown that the "exacting standard" for disavowal of
16 claim scope has been satisfied here. *See Thorner v. Sony Computer Entertainment America LLC*,
17 669 F.3d 136, 1366 (Fed. Cir. 2012).

18 Although Round Rock proposed a more general definition of flash memory, the parties
19 appear in agreement that there is no particular need to construe the term unless SanDisk's arguments
20 were to prevail. Accordingly, the term will be given its ordinary meaning without any further
21 construction.

22
23 2. "detects a differential voltage from the array of non-volatile memory cells"

24 This phrase relates to the method by which memory cells in the claimed flash memory can
25 be "read." SanDisk argues that the plain claim language means that one voltage from the "array" of
26 memory cells is compared to another voltage from the array. Round Rock contends a voltage from
27 the array is to be compared to a "reference" voltage, *not* to another voltage "from" the array itself.
28

1 It appears that some of disagreement between the parties may arise from differing views as to what
2 is encompassed within “the array.”

3 In this instance, Round Rock is the party attempting to read more into the claims from the
4 specification than is warranted. While Round Rock’s notion that detecting a “differential voltage”
5 requires comparing one voltage to a “reference” voltage is sound, it has not demonstrated a basis to
6 read a limitation into the claim that the reference *must* come from some place external to the array.
7 Conversely, however, SanDisk has not shown that either the language of the claim or anything in
8 the specification would preclude a reference voltage coming from somewhere outside the array—
9 regardless of what is or is not considered to be part of the array.

10 Despite its contention that the reference voltage must be external to the array, the
11 construction proposed by Round Rock does not actually specify such a limitation, and otherwise
12 appears to add some clarity that would assist the trier of fact.⁷ Accordingly, this phrase will be
13 given the construction, “discerns a difference between a voltage in the array of non-volatile memory
14 cells and a reference voltage.” Nothing in this construction precludes the possibility of a reference
15 voltage coming from within the array.

16 17 18 **G. ’053 patent**

19 The ’053 patent relates generally to flash memory devices that wherein the tradeoff between
20 speed and power consumption can be adjusted. SanDisk proposes construing one term appearing in
21 a claim that has not been asserted against it in this litigation. SanDisk argues that in light of its
22 status as a declaratory relief plaintiff and the fact that Round Rock has asserted this claim against
23 others, it would be appropriate to construe the term at this juncture.

24 The term SanDisk would like addressed is, “the adjustable current consumption being set to
25 the low power mode,” which it argues should be construed as, “the current and power used by the
26


27 ⁷ The substitution of “discerns” for “detects,” however, is not warranted.
28

1 memory device being reduced.” Round Rock proposes, “setting the device to a mode for reducing
2 the current and power used by the memory device.” Although there may be some substantive
3 disputes embedded in the parties’ respective positions, their arguments largely focus on how each
4 side believes the concepts would be most clearly conveyed to the trier of fact. At this juncture, no
5 compelling reason has been presented to adopt either of the proposed constructions, particularly
6 given that the claim is not being directly asserted in this litigation. Accordingly, no construction
7 will be adopted at this time.

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9
10 IT IS SO ORDERED.

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12 Dated: 5/7/13

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RICHARD SEEBORG
UNITED STATES DISTRICT JUDGE